DOCUMENT RESUME

ED 116 552 HE 006 929

AUTHOR Han, Stjepan; And Others
TITLE Forecasting Student Entrants, Flows and Success Rates. Technical Report. Studies in Institutional Management in Higher Education.
INSTITUTION Organisation for Economic Cooperation and Development, Paris (France). Centre for Educational Research and Innovation.
PUB DATE 4 Nov 71
NOTE 48p.; Paper presented at the Evaluation Conference on Institutional Management in Higher Education (Paris, France, November, 1971)

EDRS PRICE MF-$0.76 HC-$1.95 Plus Postage
DESCRIPTORS *Comparative Education; Cultural Differences; Demography; *Enrollment Rate; Flow Charts; *Higher Education; Information Systems; *Socioeconomic Background; *Success Factors
IDENTIFIERS *University of Novi Sad (Yugoslavia)

ABSTRACT

This document is concerned with an information system to study the internal dynamics of student flows, choice of subjects and success rates, taking into account different regional affiliations and the socioeconomic backgrounds of students. Among the external factors to be considered will be the demographic dimension in terms of changes in the number of potential entrants due to demographic influences. Equally important consideration is being given to technological developments in the country. Thus far, an inquiry covering 1,200 secondary school dropouts in the autonomous region of Voivodina came to the conclusion that eight high school pupils out of ten intend to continue their education at a university and that they are interested in studying law, arts, economics, engineering, and technology. A thorough investigation of student flows at the Faculty of Economics of the University of Novi Sad came to the conclusion that forecasting the number of incoming students must take into consideration the large variations in the number of entering students, the relatively small number of graduates, and the relatively large number of dropouts after the first and the second year of study. (Author)

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centre for educational research and innovation

STUDIES IN INSTITUTIONAL MANAGEMENT IN HIGHER EDUCATION
- UNIVERSITY OF NOVI SAD -

FORECASTING STUDENT ENTRANTS, FLOWS AND SUCCESS RATES

technical report

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Paris, 4th November, 1971

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Centre for Educational Research
and Innovation

CERI/IM/71.46

EVALUATION CONFERENCE ON INSTITUTIONAL MANAGEMENT IN HIGHER EDUCATION

(2nd-5th November, 1971)

- UNIVERSITY OF NOVI SAD -

DEVELOPING AND TESTING AN INFORMATION SYSTEM FOR FORECASTING STUDENT ENTRANTS, FLOWS AND SUCCESS RATES

Project Leader : Professor Stjepan Han, Director,
Institute of Management Sciences,
Faculty of Economics in Subotica,
Novi Sad University.

Team Members : Joseph Kesler
Dušan Jarie

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PREFACE

What role should be assigned to universities in the design of the future post-secondary education structure? What are the major curricular and pedagogical innovations needed by universities consistent with the growth of knowledge and the social need for specific skills? What techniques and methods of management can be introduced within the university environment to enable the institution to plan its activities adequately and to use the available resources effectively? These are some of the major issues facing universities, and the OECD's current programmes in the field of higher education are concerned with all of them. The present series of publications arises from one of CERI's programmes concerned with the problems of university management.

In CERI's programme on institutional management in higher education, eight universities were brought together to set up teams within their institutions to work on their respective pre-selected problem areas.(1) These teams have worked over varying lengths of time, none of which exceeded two years. The results of their work, together with the results of the research done within the Secretariat, will be presented before a broad audience of university executives and managers and government representatives from the OECD Member countries at the Evaluation Conference scheduled for November 2nd-5th 1971.

The programme's work has now produced analyses of the major problem areas of university management and the general directions in which solutions to these problems must be sought. By concentrating the effort in selected university environments the approaches developed may not have the attraction of generality, but this has been more than offset by its demonstrating concrete ways of tackling the specific problems of university management.

In my view, the body of effort represents significant contributions to at least five areas:

First, being aware of the fact that universities have become major consumers of financial resources, we have been able to indicate methods for evaluating the requirements of resources and their costs not only for the university as a whole but especially for its different components. This has involved using the budget as a planning tool by linking expenditures as far as possible to the objectives of the programmes for which these expenditures have been incurred.

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(1) These universities are the Free University of Berlin, University of Bradford, University of Copenhagen, Technical University of Gothenburg, University of Lancaster, University of Nijmegen, University of Novi Sad, University of Paris-West at Nanterre. The Copenhagen University project, however, was carried out by a team from the Technical University of Denmark.

Second, it has been possible to demonstrate the costs and consequences of different decisions concerning selected university matters both for current operations and for expansion, in order that policy-makers may choose desired courses of action. Such an approach offers an opportunity for effectively reducing the arbitrariness of decisions about allocating resources, and thereby improving the general efficiency of operations.

Third, early in the development of the programme it was found that the basic information requirement for university-wide management was either lacking or was too dispersed among various bodies for it to be used effectively by decision-makers. It was possible, in the programme, to carry out pilot exercises not only to determine information availability and requirements, but also to propose setting up an information base within the university geared to the needs of the decision-makers.

Fourth, computer-based mathematical techniques and models have been constructed and tested to demonstrate their potential usefulness in providing a range of results quickly and efficiently, not only for the specific problems of the university for which they were constructed, but also for similar problems in a large number of different universities.

The work of the eight universities and the CERI central staff is a basis for a more widespread effort to improve the management of universities. Universities will remain vital institutions of our societies, offering ideas and skills which are necessary prerequisites for healthy social and economic progress. They must nevertheless respond to the need to ensure the effective management of their resources, and it is hoped that the study now completed will contribute to a management movement throughout the university systems of the Member countries.

The Novi Sad project was set up last year with Professor S. Han as the project Leader.

The project is concerned with an information system to study the internal dynamics of student flows, choice of subjects and success rates, taking into account different regional affiliations and the socio-economic backgrounds of students. Among the external factors to be considered will be the demographic dimension in terms of changes in the number of potential entrants due to demographic influences. Equally important consideration is being given to technological developments in the country. Thus far, an inquiry covering 1,200 secondary school drop-outs in the autonomous region of Voivodina came to the conclusion that eight high school pupils out of ten intend to continue their education at a university and that they are interested in studying law, arts, sciences and medicine. Less interest is shown for faculties of agronomy, economics, engineering and technology. A thorough investigation of student flows at the Faculty of Economics of the University of Novi Sad came to the conclusion that forecasting the number of incoming students must take into consideration the large variations in the number of entering students, the relatively small number of graduates, and the relatively large number of drop-outs after the first and the second year of study.

DEVELOPING AND TESTING AN INFORMATION SYSTEM FOR FORECASTING STUDENT ENTRANTS, FLOWS AND THEIR SUCCESS RATES AT THE UNIVERSITY OF NOVI SAD, YUGOSLAVIA

Progress Report

The project is concerned with an information system to study the internal dynamics of student flows, choice of subjects and success rates, taking into account different regional affiliations and the socio-economic backgrounds of the students.

The external factors to be considered will, among others, cover the demographic dimension in terms of changes in the number of potential entrants due to demographic influences.

Equally important, consideration shall be given to technological developments in the country.

Thus for an inquiry, covering about 1,200 secondary school drop-outs in the autonomous region of Voivodina, came to the conclusion that eight high school pupils out of ten intend to continue their education at a university and that they are interested in studying law, arts, sciences and medicine, less interest being shown for the Faculties of agronomy, economics, engineering and technology.

A thorough investigation of student flows at the Faculty of economics of Novi Sad University came to the conclusion that forecasting the number of new entrants must take into consideration:

- large variations in the number of entering students,
- relatively small numbers of graduates,
- relatively large numbers of drop-outs after the first and second year of study.

A. The Importance of Rational Management of Institutions of Higher Education

The fundamental aim of the research in the field of management of institutions of higher education is to increase the efficiency of the university as a system, primarily by introducing a better decision-making process, based on an efficient information system. The study of the university as a complex system gives priority to medium-term and long-range planning. The mathematical models we are going to apply will be "open" by their nature and will present a suitable basis for a

rational discussion on decisions which have to be made by managers of institutions of higher education, be they teachers, students, administrative staff or other members of these institutions as well as representatives of the interested segments of society.

A.1. The University as a Complex System

The university is considered in this joint project as a complex system composed of the following sub-systems:

2.1. The human flow sub-system.

2.2. The physical plant planning sub-system.

2.3. The finance sub-system.

2.4. The information sub-system.

2.5. The academic planning sub-system.

2.6. The decision-participation sub-system.

A.2. Sub-system of Human Resources

A.2.1. The sub-system of human resources is composed of all three participant groups working at the Faculties.

- teaching staff,
- administrative (non-teaching, etc.) staff,
- students.

The number of teaching and non-teaching staff is, viewed on a short-term basis, roughly constant. Large changes take place, however, in the size of the student body.

In the sub-system of students flow we notice: input, educational process and output.

Secondary School Pupils Requirements of Society I II III IV V

The input into the sub-system is fed by secondary school pupils who are going to enroll in a Faculty. They are the potential resources of the Faculty sub-system.

The educational process is carried out by a Faculty for a definite number of years of study. The students flow from I till IV and V study years respectively.

The output of the sub-system is created by graduating specialists who leave the Faculties. The output is connected with the requirements of the society for university graduates.

The output of the sub-system is directly dependent on the input if it is assumed that the educational process is in general uninterrupted. In a certain way the number of graduates depends on the number of students enrolled.

However, there also exists a feed-back between the requirements of the society and the input in the sub-system. The requirements for university graduates retroactively influence the number of students who are to be enrolled in the university. By relating the input and output of the Faculty sub-system, an undue number of experts in some fields is avoided.

A.2.2. In each Faculty there are large and frequent changes in the student flow, with people staying or leaving. It is of great importance to have exact and reliable information available about the state and flow of the number of students enrolled at every moment. In addition to this it is indispensable to forecast as exactly as possible how many students and teachers and what the financial needs will be in the future.

The trend in the number of students or the flow of students is related to the success of study from the beginning till the end of school. In this space students pass from one year to another, come from other Faculties or transfer to other Faculties.

For the purpose of illustration we give an example of how student flows are followed and computed.

On the basis of computing several generations we get average parameters of the student flow. These parameters enable us to compute the flows of the expected number of students.

When planning the expected number of students, both the requirements for university graduates and the forecasts of the number of high school pupils coming to the university have to be taken into consideration.

A.2.3. The requirements for university graduates are determined by social developments, economic growth, the scientific and technological revolution and other factors. They have to be taken into consideration if we want to make the right educational policy.

A.2.4. The input of the sub-system of human resources is composed of high school graduates. When computing the input of this sub-system, we need to consider:

- demographic pressure,
- number of high school graduates,
- choice of study,
- success in high school.

It is indispensable to get data as accurate as possible about the choice of the future profession studies and Faculty. The answers to these questions could be got by means of a statistical questionnaire

given to pupils before they graduate from high school. With a certain degree of probability these questionnaires would be a real basis for planning the influx of students from single regions, high schools or intermediate schools. Additional indices would be their success in school and their socio-economic origin. After predicting the number of students we estimate the requirements in teaching staff, assistants, non-teaching staff, space and material facilities.

B. The Development of Novi Sad University

In the 1938-39 academic year Yugoslavia had 24 Faculties with a total of 17,038 students plus two colleges of higher learning with 259 students. Such a small number of institutions of higher education could not meet the rapidly growing needs in social development. Therefore a more venturesome and quicker establishment of institutions of high and higher education was initiated, which can be seen from the table below.

Table 1

Year	Number of Fac.	No. of students	No. of colleges	No. of students	Total No. of inst.	Total No. of students
1938-39	24	16,789	2	259	26	17,038
1955-56	56	62,045	25	7,605	81	69,650

In 1945 a one-year preparatory course for teachers of higher forms of elementary schools was opened in Novi Sad. This course was transformed in 1946 into a teachers' training college. The establishment of this course can be considered as the starting point for the development of higher education in the province of Voivodina. The teachers' training college in Zrenjanin was founded in 1954. The Agricultural and Philosophical Faculties were established in the same year. Both Faculties were functioning as part of Belgrade University. However, their establishment can be considered to be the beginning of Novi Sad University. In the 1955-56 academic year there were 983 students in both Faculties and 672 students in both teachers' training colleges.

Further social development, profound changes in the system of education and the new law on higher education enabled a faster development of institutions of higher education and an increase in the number of students. Most Faculties and colleges were established between 1958 and 1961.

- in Yugoslavia 34 Faculties and 78 colleges
- in Serbia 15 Faculties and 37 colleges
- in Voivodina 5 Faculties and 6 colleges

KEY
U University
Faculty
College
Subotica
1
3
Zrenjanin
2
U
NOVI SAD
7
5
U
BELGRADE
20
13
Požarevac
1
Arandjelovac
Kragujevac
1
Bor
1
1
Titovo Užice
1
Čačak
1
1
Trstenik
Kruševac
1
U
Niš
3
1
Leskovac
1
2
Kosovska Mitrovica
U
PRIŠTINA
2
2
Peć
1
Vranje
1
Prizren
1

11

During this period, the following were established in Novi Sad:

- the Faculty of Law and the Faculty of Technology in 1959;
- the Medical Faculty in Novi Sad and the Faculty of Economics in Subotica in 1960;
- the University of Novi Sad was founded in 1960;
- the Higher Commercial Schools in Novi Sad and Subotica;
- the Higher Technical Schools in Zrenjanin and Subotica and the College of Architecture in Subotica were established in 1959.

This network of institutions of higher education has remained almost unchanged up to the present moment. The only changes that took place are the establishment of the Faculty of Natural Sciences in Novi Sad, which was previously a group within the Faculty of Philosophy. Two institutions, the College of Social-Political Sciences as well as the College of Civil Services and Social Work in Novi Sad were shut down in 1966 and 1969 respectively, while in 1968 a Teachers' Training College was established in Subotica.

Accordingly, the present network of institutions of higher education is composed of 8 Faculties: Philosophy, Natural Sciences, Law, Economics, Agriculture, Engineering, Medicine and Technology; and 8 Higher Schools or Colleges: Teachers' Training Colleges in Novi Sad, Zrenjanin and Subotica, Higher Business School in Novi Sad, Higher Technical School in Novi Sad, Subotica and Zrenjanin and the College of Architecture in Subotica.

Table 2

Number of Students and Teaching Staff at the Beginning of 1960-61

Faculty	Number of enrolled students		Number of students per year			
	Regular	Irreg.	I	II	III	IV
Agriculture	775	464	754	202	112	171
Philosophy	599	432	406	212	229	184
Technology	233	101	257	77	-	-
Law	352	378	383	347	-	-
Medicine	166	-	166	-	-	-
Engineering	159	194	353	-	-	-
Economics	216	658	874	-	-	-
	2,500	2,227	3,193	838	341	355

Data Source: Ing. Teodor Avramovic: "Establishment and beginning of work of Novi Sad University", Novi Sad, March 1961, page 14.

Table 3

Number of Teaching Staff at the Beginning 1960-61

Faculty	Lecturers		Assist. Lecturers		Total
	Full	Part-time	Full	Part-time	
Agriculture	27	8	48	2	85
Philosophy	22	13	28	19	82
Technology	9	13	6	19	47
Law	5	11	-	3	19
Medicine	3	1	2	6	12
Engineering	2	5	2	14	13
Economics	5	4	1	4	14
	73	55	87	67	288

Table 4

Number of Teaching Staff at the Beginning of 1969/70

Number of Students

Faculty	Number of enrolled students		Number of students per year				
	regular	irreg.	I	II	III	IV	V
Agriculture	1,075	175	708	258	159	115	
Philosophy	1,056	613	688	319	506	156	
Technology	792	197	482	270	150	45	40
Law	1,068	806	1,185	305	297	87	
Medicine	944	-	158	220	225	179	162
Engineering	975	75	470	249	224	49	58
Economics	1,002	912	963	246	562	143	
Natural sciences	1,114	840	735	345	721	153	
	8,026	3,618	5,389	2,212	2,844	917	260

(1) Ing. Teodor Avramovic: "Establishment and Beginning of work of Novi Sad University", Novi Sad, March 1961, page 15.

(2) Report on the work of Novi Sad University (tabular review for the academic year of 1969-71 Novi Sad, 1970, table No.XXIX).

Table 5

Number of Teaching Staff at the Beginning of 1969-70

Faculty	Lecturers		Assist. Lecturers		Total
	Full	Part-time	Full	Part-time	
Agriculture	77	13	35	6	131
Philosophy	35	10	45	1	91
Technology	21	9	35	13	78
Law	16	13	14	2	45
Medicine	52	8	55	-	115
Engineering	23	12	37	10	82
Economics	23	13	20	5	61
Natural sciences	25	21	30	20	96
Centre for Physical Training (Sports)	6	-	-	-	6
	278	99	271	57	705

From the above tables the conclusion can be drawn that the number of regular students is three times larger. This index cannot be taken into consideration because not all Faculties offered all 4 study years the very first year they were set up. However, taking this into account, as well as the fact that there is a large increase of the number of students (for surely it is less than 3 times), a reliable comparison can be made with the total number of enrolled students in the first study year. It can be noticed that the number of enrolled students (regular and irregular) in the first year, 1969-70, is about twice as large as the number of students in the 1961-69 academic years.

Comparing the data on the number of teaching staff in 1960-61 and 1969-70, the most important conclusion emerging is that the number of full-time teaching staff is increasing both absolutely and relatively.

This is of the utmost importance for improving the process of instruction and the result of studies.

(1) Annual report of Novi Sad University for the academic year of 1969-70, Novi Sad, 1970, table No.XXXIII.

Table 6

Number of Graduates of the Faculties of Novi Sad University before November 15th 1969

Faculty	Regular students	Irregular students	Total
Economics	457	356	813
Engineering	189	-	189
Medicine	275	-	275
Agriculture	979	12	991
Law	407	355	762
Technology	234	52	286
Philosophy	1,046	272	1,218
Total	3,587	1,047	4,634

The above table shows that the largest number of graduates are in the Philosophy, Agriculture, Economics and Law Faculties, whereas the Technology, Medicine and Engineering Faculties have a substantially lower number of graduates.

The dynamics of the number of students in Yugoslavia and Voivodina is given in table 8. The comparison refers to the period between the establishment of Novi Sad University and 1969-70. The conclusion is that the number of students is growing faster in Voivodina than in Yugoslavia. Such a rapid growth of the number of students is most evident beginning with 1968-69, both in Yugoslavia and Voivodina.

(1) Report on the work of Novi Sad University - tabular review for the academic year 1969-70, Novi Sad, 1970, table XVII.

Comparing the student enrolment pattern in separate Faculties in Yugoslavia and Voivodina, it can be concluded that there are proportionally more students enrolled in the Faculties of Economics, Engineering, Agriculture, Law, Natural Sciences, and Technology in Voivodina than in Yugoslavia, whereas relatively smaller number of students are enrolled in the Faculties of Medicine and Philosophy and in art academies.

(1) Federal Statistical Bureau, Statistical Bulletin-Schools of Higher Learning, 1969-70, No.670, Belgrade, June 1970.

Table 7[1)]

DYNAMICS OF THE NUMBER OF STUDENTS IN UNIVERSITIES AND ACADEMIES IN YUGOSLAVIA AND VOIVODINA 1960/61 - 1969/70

/FULL TIME+PART TIME/

	YEAR	60/61	61/62	62/63	63/64	64/65	65/66	66/67	67/68	68/69	69/70
YUGOSLAVIA	ABSOLUTE FIGURES	108,912	117,112	112,310	107,214	107,426	116,273	120,110	128,240	147,497	161,800
	INDEX 1960/61 = 100	100	108	103	107	99	107	110	117	135	148
VOIVODINA	ABSOLUTE FIGURES	4,841	5,807	6,931	7,184	7,718	8,384	8,131	8,384	10,145	11,328
	INDEX 1960/61 = 100	100	120	143	149	149	170	168	173	209	234

1) Federal Statistical Bureau, Statistical Bulletin on Schools of Higher Learning No. 255, 339, 364, 397, 439, 509, 574, 622, 670.

Table 8

Number of Students Enrolled in Universities and Academies in Yugoslavia and Voivodina (1969-70)

No.	Faculty	Yugoslavia Abscl. Numb.	%	Voivodina Absol. Numb.	%
1.	Economics	23,282	14	1,906	17
2.	Engineering	7,802	4	1,051	9
3.	Medicine	11,583	11	946	8
4.	Agriculture	6,500	4	1,232	11
5.	Law	25,157	15	1,875	16.6
6.	Natural Sciences	12,725	8	1,821	16
7.	Technology	7,088	4	988	9
8.	Philosophy	24,394	15	1,468	13
9.	Art Academies	2,355	1	41	0.4
10.	Other Faculties	40,914	24	-	-
Total number of students		161,800	100	11,328	100

Table 9

Number of Teaching Staff in Universities and Art Academies in Yugoslavia and Voivodina (1967-68)

No.	Faculty	Yugoslavia Absol. Fig.	%	Voivodina Absol. Fig.	%
1.	Economics	656	6	55	8
2.	Technology	4,149	34	152	23
3.	Medicine	1,851	15	103	16
4.	Agriculture	1,094	10	131	20
5.	Law	527	4	39	6
6.	Philosophy	1,937	16	170	26
7.	Art Academies	483	4	6	1
8.	Other Faculties	1,332	11	-	-
	Total	12,032	100	656	100

From the above table it can be seen that from the total number of teachers, the Faculties of Economics, Medicine, Law and especially

Agriculture and Philosophy in Voivodina have proportionally a larger staff compared with the same Faculties in Yugoslavia. As for the Faculty of Technology and the Art Academies, the conclusion is the opposite.

(1) Report on the work of Novi Sad University 1966-67, table No.XXX.

(2) Statistical Yearbook of Yugoslavia, 1967, pages 282 and 480. Beginning with 1967-68 data regarding teaching staff has been gathered every three years.

C. Choice of Faculty: A Survey Covering about 1,200 Secondary School Drop-outs in the Autonomous Region of Voivodina

In the course of March 1971 the universities of Serbia carried out research on the orientation for studies of the students graduating from secondary schools within the territory of Serbia, using quantitative methods to handle the admission of new students at the university.

The aim of this research was twofold: first, to establish the orientation of students as to their choice of Faculty or college, and secondly, to find out the most important factor ruling the behaviour of men when they choose their path of future study. This second aim dealt concretely with:

(a) the influence of sex, the type of social environment the student comes from, the kind of secondary school attended, and the marks they had there, their social background, etc. on the choice of studies;

(b) the reasons and drives behind a decision when choosing where to study.

A questionnaire with 24 questions was used as the basic means for collecting information, and the students gave the answer by themselves. Before the students started answering, they were given the list of universities, colleges and academies of arts in Serbia. In this way the need for this kind of basic information was satisfied. The questionnaire was sent to 65 secondary schools - chosen on the principle of taking stratified sample - which make up 10 per cent of all secondary schools existing in the territory of Serbia. The autonomous region of Voivodina is represented in the sample with 12 secondary schools with 1,200 pupils in graduating classes.

The questioning included 7 grammar schools, 2 technical schools, a training college, an agricultural school and a commercial school, which can be found in almost any big town in Voivodina: Novi Sad, Sombor, Subotica, Vrsac, Kovin, Sid, Sr. Mitrovica and Kikinda.

The results of this research on the orientation of the students from the graduating classes of secondary school in the territory of Voivodina will be presented later. But the results given and conclusions drawn are probably not completely correct, because the sample cannot be treated as a representative one. The reason is that the research was done for all of Serbia. The part that covered the territory of Voivodina

was taken out of the sample and consequently these 12 secondary schools with 1,200 students are not a model representative of Voivodina.

The first aim of this research, as has already been said, was to find out the number of pupils in the graduating classes of secondary school who had made the decision to continue their studies and to determine which institutions of higher education they would enter.

The results of the research show a very high percentage of pupils who intend to continue their schooling - 8 pupils from 10 per cent or 83 per cent. Most of them (83 per cent) decided to enter university, 12 per cent the colleges and 5 per cent the academies of arts. Which Faculties of the University of Novi Sad are the students the most interested in? First of all comes the Faculty of Law (13 per cent), then the Faculty of Arts, Faculty of Science, Faculty of Medicine (12 per cent). The students of this generation of secondary school graduates show less interest in the Faculty of Economics (8 per cent), Faculty of Technology (5 per cent), Faculty of Agriculture (4 per cent) and Faculty of Engineering (3 per cent).

The development of modern-day science required dividing up studies at most Faculties into groups, sessions and courses.

It is interesting to see how the students decide for themselves - of course, only at the Faculties where such division exists starting with the first year of studies. At the Faculty of Agriculture, interest in fruit-growing, wine-growing, cattle-breeding and the section for agricultural techniques predominates, while at the Faculty of Science it is biology, chemistry and mathematics, and at the Faculty of Arts it is Serbo-Croate language and Yugoslavian literature, English and German languages.

The decision to continue schooling in general after the secondary school and especially the choice of the institution of higher education is the result of a succession of factors. First of all, these include sex, the type of social environment the student came from, the type of secondary school attended and the marks obtained there, and the student's social background. The influence of each of these factors on the behaviour of young people when making the decision will be considered in turn but the order in which they are taken up is in no way connected with the proportion of influence of any one factor.

C.1. Choice according to sex

The influence of sex, as a natural factor, on making a decision about continuing schooling at one of the existing higher education institutions and about the choice of subjects is, by all means, a very interesting question.

First of all, in this research, the goal was to establish if there is any - and how much - difference between girls and boys of the same age as far as intending to continue schooling and choosing the place to do so. The results of the research showed that there is a sex difference in making both decisions. It is necessary to say that the differences are not great, yet they are statistically significant.

Boys decide to continue schooling after the secondary school in a higher percentage (90 per cent) than do girls of the same age (79 per cent), and their interest is primarily turned towards the university (76-64 per cent in favour of boys), compared to girls who are more oriented towards the colleges. Differences are noticed between the sexes when choosing the Faculty to study at. Girls are primarily oriented towards the Faculty of Economics (11-5 per cent), Faculty of Science (15-8 per cent) and Faculty of Arts (18-5 per cent), while boys are oriented towards the Faculty of Engineering (6-0, 4 per cent), and the Faculty of Agriculture (7-1 per cent). There are very slight differences at the Faculty of Medicine (13-11 per cent in favour of boys), the Faculty of Law (17-16 per cent in favour of girls), and Faculty of Technology (5-3 per cent in favour of girls).

C.2. Choice According to Types of Settlements

The type of settlement lived in while attending secondary school had an influence both upon making a decision about continuing schooling and upon the choice of subject. The general conclusion reached was that the smaller the place, the less the students continue their studies, but for those who do they are more oriented towards professional education in colleges.

Students from towns have a series of objective advantages over those living in the country, and it is quite clear why more of them decide to continue schooling (pupils from towns in 87 per cent of cases and pupils from the country in 74 per cent of cases) and mainly at the university (74 per cent of pupils from towns to 57 per cent of pupils from the country). Pupils whose home is in the country are oriented towards the Faculty of Economics, Faculty of Agriculture, Faculty of Science and Faculty of Technology, while pupils from town are oriented towards the Faculty of Medicine, Faculty of Law and Faculty of Arts. At the Faculty of Engineering no differences of this kind were noted.

C.3. Type of Secondary Schools

The result of the research show that the type of secondary school the pupils graduated from has an influence on the decision to continue at one of the institutions of higher education. Almost all the graduates from grammar school (96 per cent), depending on the type of school they completed, showed the intention to continue school, except in some rare cases, mostly girls, who preferred to marry after secondary school. Pupils from other secondary schools show less interest in studies at a higher level than the grammar school pupils. This is evidently the consequence of the type of school they attended. With the diploma they get a qualification that puts them in a position to work in economic life or social services. These are mainly the students from teachers training colleges (61 per cent), commercial school (49 per cent) and technical school (42 per cent, 5 per cent).

The type of secondary school influences the choice of college, such that students of agricultural and technical schools prefer college to university.

Almost all the Faculties of the University of Novi Sad are the centre of interest of the graduates from grammar school, except, in part, the Faculty of Engineering and Faculty of Technology.

There is usually a high correlation between the type of secondary school attended and the field of science to be studied, so that it can be said that pupils of this generation of secondary school graduates have an adequate orientation. For example, 70 per cent of the pupils from commercial school went to study at the Faculty of Economics, and 58 per cent of pupils from agricultural school went on to the Faculty of Agriculture.

C.4. Marks in Secondary School

This factor had enormous significance and it should have been a kind of a regulator of further schooling. However, research shows that this hypotheses is not right, because lack of success in secondary school does not have much influence on students' consciences or their decision to continue in school. Thus, the urge to study at the university or another institution of higher education is so strong that it sweeps aside the objective indicator of poor marks as a prerequisite for success and effectiveness in further studies. That is why the outcome is so crushing for the university and society in general. This can easily be proved when analysing the marks at our Faculties. What do the results of a research show?

Poor students decide to continue to study in smaller numbers than do the better ones, (95 per cent of excellent students want to continue their schooling as opposed to 75 per cent of adequate students), and the poor students turn more towards college while the good ones prefer the university (90 per cent of excellent students to 54 per cent of poor students).

Success attained in the secondary school does not influence the choice of subject matter. We merely noticed that excellent and very good pupils are oriented towards the Faculty of Medicine but not towards the Faculty of Law.

C.5. Social Background of Students

In this period of our social and economic development, the social background of the prospective students has a certain social and sociological meaning, firstly because it provides the chance to continue schooling in general, as well as affects the choice of higher education institution. Social background is a complex notion that includes three basic elements:

1. Parent's profession.
2. Level of their professional education.
3. Their standard of living.

Statistical data are collected by standard category of professions used by our official statistics for years. The father's profession is taken as a determining element for establishing the type of family the

student comes from. The reason for this is that 34 per cent of mothers are housewives and their social position as well as that of their children depends on their husbands'activity.

The social group students belong to determines their way of living and thinking. All these factors influence students' decision and differences of this kind are quite understandable.

The results of this research correspond to scientific conclusions and constitute yet further proof that membership in a certain social group requires a set of rules of behaviour, in this case, both when deciding to continue schooling and in choosing the field of study. In short, children from farmer (73 per cent) and worker families (77 per cent) decide in a smaller number to continue their schooling than do the children of clerk families. The intention to go on studying is especially characteristic of experts' children (96 per cent) as well as those of police and military personnel (92 per cent), office and management staff (90 per cent).

When choosing a higher education institution, it is noticed that children of farmers, workers and especially tradesmen (15 per cent each) tend to prefer college, while children of experts and managing officers are almost always oriented towards the university.

A difference is noted among students when deciding what Faculty to study at, and this is done with reference to the social group they belong to. A high percentage of children of farmers and workers decide in favour of the Faculties of Social Science (Economics, Law and Arts), and partly for the Faculty of Science. This phenomenon is very interesting and its explanation is probably that our society industrialised and organised quickly, thereby forcing rural districts into the background. On the other hand, for many young people from the country, getting higher education presents a possibility to leave the country and move to town. It is natural that they do not decide to earn a diploma which would lead them back to the country and force them to live and work there. Therefore, there is a tendency among youth from the country to graduate from the Faculties of Social Science, so that they can have a profession linked directly with the town. Children coming from employees' families opt above all for the Faculties of Medicine, Science and Arts.

Data on the educational background of pupils' parents is collected too. According to the rules of our official statistics, this means the qualification level for workers and the educational level for others. This research showed that the professional education of students' parents has an influence on the decision to continue schooling and on the choice of subjects studied. In short, the higher the qualification (for workers) or the educational level (for others), the greater the likelihood of their children continuing their studies. Students whose parents have a high level of education are oriented towards the university, while the children of parents with a lower level of education are oriented towards college.

The choice of Faculty does not directly depend only on the level of education of pupils' parents, but it is closely related to two other elements of students' social backgrounds. In the table, one can notice the orientation of students towards the Faculties connected with different degrees of their parents' professional education.

The standard of living of students' family or household is perhaps the most important element in social background when discussing the effect it has on the decision to continue studying after graduation from secondary school and the choice of school. This factor also presents one of those limits on the desire to study which is very hard to overcome: the lower the standard of living of the student, and the further the university centres and colleges are from his home, the less he is likely to continue his studies. School itself is free of charge but other things, like food and lodging, are very expensive. Therefore, it is natural that a large number of secondary school graduates must give up their ardent desire to pursue their education and must find another solution for their professional future. The results of this research show evidently that the decision to continue schooling is conditioned by the standard of living. In other words, the intention to continue one's education diminishes in the lower income brackets for the students. Thus, for example, 63 per cent of children from families with an average income lower than 700 dinars have the intention of continuing their studies, in contradistinction to 96 per cent of those children whose parents have an income of 2,000 dinars. Pupils from families with higher incomes opt for Faculties while pupils from families with lower incomes are oriented towards colleges. Accordingly, this factor decides on the realisation of a subjective wish to study at either the university or another educational institution. It is certain that many young and talented people remain forever outside the process of higher education, and this has many deleterious effects on both them and the society in general. The orientation of students towards the Faculties as a function of the average monthly income of their family is shown in the table.

All the aforementioned elements of the social background of students are interwoven and cannot be divided. They are extracted from the whole pattern. Our intention is to stress their interrelation and the meaning of combining these factors which can influence the pupils' decision in one way or another.

There are many reasons and motives that guide young people while they are deciding whether to continue studying after graduation from secondary school and while they are choosing an institution of higher learning to study at. Depending on the personal feelings and experiences of individual, as well as on many external conditions, these reasons and motives can be deep or shallow, permanent or temporary. They may well be influenced by a particular situation, as well as by what they are aiming for in their own professional future.

One of the purposes of this research was to find out the reasons and motives that guide students in their choice of Faculty at the University of Novi Sad, and to determine the intentions of those students who do not want to continue their schooling at one of the existing institutions of higher learning and find out the reasons behind such a decision. Firstly, we discuss those pupils who said that they would not continue their studies in one of the institutions of higher learning. The basic and main reason for making such a decision is a low standard of living that prevents them from realising their ambitions. All these students want to find a job to improve their financial situation and as part-time students they fulfil their desire to study a certain field of science. Therefore, the examples of students who declared that they would not continue their schooling show how strong the thirst for knowledge is in our young generation. Society should be happy to see such a phenomenon

and strive hard to fulfil the wish of young people, to make further schooling possible for them, especially since the benefits are enormous on both sides.

What are the basic reasons and motives which guide students in making a decision about the choice of what and where to study? First of all, there is an intersection of reasons and motives that work together such that cases in which only a single one appears do not exist. However, we have noticed that the decision in favour of a certain Faculty depends, first of all, on inner impulses linked to students' interest in certain fields of knowledge, because this appears in all combinations. Such students, let us call them the motivated ones, were numerous in this research, on the average every second student: 47 per cent of those who intended to continue schooling after graduation from secondary school.

The results of the research on the reasons and motives behind choice of certain Faculties of the University of Novi Sad are very interesting. The most highly motivated are those candidates who decide to study at the Faculty of Arts (72 per cent) and the Faculty of Medicine (60 per cent). The least motivated are the prospective students of the Faculty of Economics (44 per cent), but these have another very important reason, namely, real chances to find employment (24 per cent). This reason was found among students of the Faculty of Engineering in the same percentage, but in a lower percentage than at the Faculties of Law and Science. A large number of students (21 per cent) who select the Faculty of Technology stress, as the reason for their decision, the standard of living they hope to attain in this profession.

D. Flows of Ten Generations of Full-Time Students of the Faculty of Economics in Subotica from 1960-70

By "student flow" we mean the observation of the dynamics of student generations from their enrolment in the 1st semester, during their study and until graduation. A generation is made up of all the students who started their studies together in the 1st semester and who graduate at the regular time. This is illustrated by Figure 1.

Applicants for Admission to the First Semester of Study

The Faculty accepts candidates for admission twice a year (only once if all places are fulfilled following the first entrance examination). The examinations are usually given in September and at the beginning of October. In addition, some students are admitted automatically, whereas others have to pass entrance examinations. Also, the students may apply to be admitted immediately upon graduation from secondary school, or after a delay of one or more years.

In estimating the size of the entering freshman class, therefore, the model considers both those students who apply immediately upon graduation and the delayed entrants. Automatic admission versus admission by examination is also considered. Some students withdraw after applying and being accepted, and this flow is also considered.

Figure 1

COMPUTATIONAL STEPS IN THE FACULTY MODEL

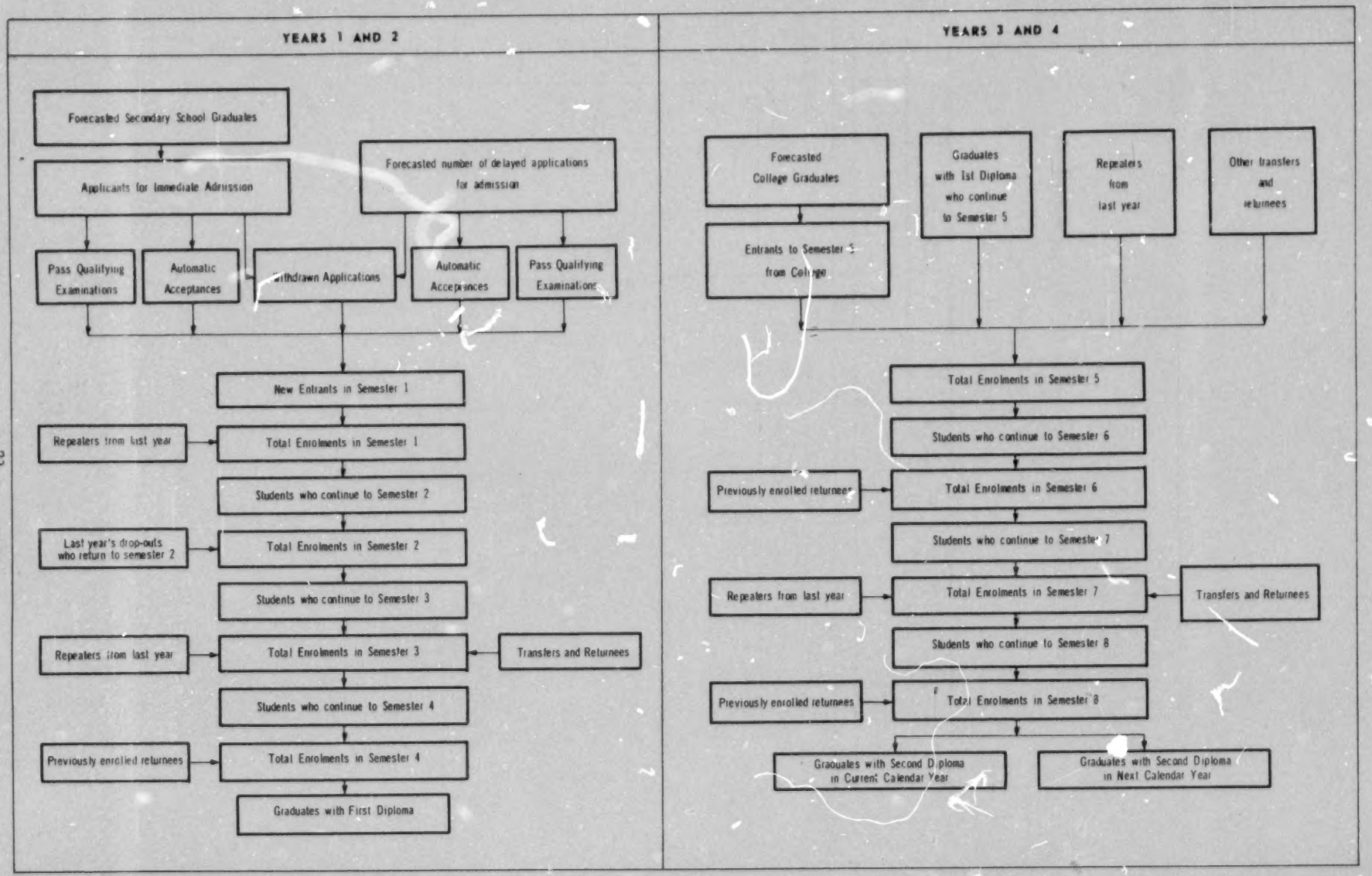
YEARS 1 AND 2
Forecasted Secondary School Graduates
Applicants for Immediate Admission
Forecasted number of delayed applications for admission
Pass Qualifying Examinations
Automatic Acceptances
Withdrawn Applications
Automatic Acceptances
Pass Qualifying Examinations
New Entrants in Semester 1
Repeaters from last year
Total Enrolments in Semester 1
Students who continue to Semester 2
Last year's drop-outs who return to semester 2
Total Enrolments in Semester 2
Students who continue to Semester 3
Repeaters from last year
Total Enrolments in Semester 3
Transfers and Returnees
Students who continue to Semester 4
Previously enrolled returnees
Total Enrolments in Semester 4
Graduates with First Diploma
YEARS 3 AND 4
Forecasted College Graduates
Entrants to Semester 5 from College
Graduates with 1st Diploma who continue to Semester 5
Repeaters from last year
Other transfers and returnees
Total Enrolments in Semester 5
Students who continue to Semester 6
Previously enrolled returnees
Total Enrolments in Semester 6
Students who continue to Semester 7
Repeaters from last year
Total Enrolments in Semester 7
Transfers and Returnees
Students who continue to Semester 8
Previously enrolled returnees
Total Enrolments in Semester 8
Graduates with Second Diploma in Current Calendar Year
Graduates with Second Diploma in Next Calendar Year

Table 10

PERMANENT RESIDENCE OF PARENTS AND CHOICE OF FACULTY

RESIDENCE OF PARENTS / FACULTY	Village		Town		Unknown		Total	
	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%
/1/	/2/	/3/	/4/	/5/	/6/	/7/	/8/	/9/
1. Medicine	16	8.2	80	12.7	2	66.7	98	11.8
2. Natural Sciences	28	14.4	73	11.6			101	12.3
3. Agriculture	14	7.2	18	2.9			32	3.9
4. Technology	13	6.7	21	3.3			34	4.1
5. Mechanical Engineering	5	2.6	20	3.2			25	3.0
6. Economics	19	9.8	52	8.3			71	8.6
7. Law	21	10.8	84	13.4			105	12.8
8. Philosophy	17	8.8	85	13.5	1	33.3	103	12.4
Faculties outside Novi Sad University	61	31.5	196	31.1			257	31.1

Table 11

TYPE OF SECONDARY SCHOOL AND CHOICE OF FACULTY

TYPE OF SECONDARY SCHOOL / FACULTY OF	GRAMMAR SCHOOL		TECHNICAL SCHOOL		COMMERC. SCHOOL		AGRICUL. SCHOOL		TEACHER TRAINING COLLEGE	
	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%
/1/	/2/	/3/	/4/	/5/	/6/	/7/	/8/	/9/	/10/	/11/
1. Medicine	95	13.8	2	2.9			1	3.0		
2. Natural sciences	98	14.2	2	2.9	1	3.7			1	8.3
3. Agriculture	12	1.7	1	1.4			19	57.6		
4. Technology	26	3.8	8	11.6						
5. Mechanical engineering	25	3.6								
6. Economics	50	7.3	1	1.4	19	70.4	1	3.0		
7. Law	99	14.4	3	4.3	1	3.7	3	9.1		
8. Philosophy	90	13.1			5	18.5	2	6.1	6	50
Unknown	26	3.8	5	7.2			2	6.1		
Facultes outside Novi Sad University	167	54.8	47	68.3	1	3.7	5	15.1	5	41.7

Table 12

MARKS IN SECONDARY SCHOOL AND CHOICE OF FACULTY

GRADES IN CLASS III OF SECONDARY SCHOOL / FACULTY OF	ADEQUATE		GOOD		VERY GOOD		EXCELL-ENT		UNKNOWN		TOTAL	
	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%
/1/	/2/	/3/	/4/	/5/	/6/	/7/	/8/	/9/	/10/	/11/	/12/	/13/
1. Medicine	7	6.2	32	8.4	30	17.2	29	18.7			98	11.8
2. Natural sciences	13	11.5	41	10.7	22	12.6	26	16.8			102	12.3
3. Agriculture	13	11.5	13	3.4	4	2.3	1	0.6	1	25.0	32	3.9
4. Technology			13	3.4	9	5.2	12	7.7			34	4.1
5. Mechanical engineering	1	0.9	8	2.1	11	6.3	5	3.2			25	3.0
6. Economics	9	8.0	35	9.1	16	9.2	11	7.1			71	8.6
7. Law	21	18.6	55	14.4	18	10.3	26	7.7			106	12.8
8. Philosophy	12	10.6	57	14.9	19	10.9	15	9.7			103	12.4
Faculties outside Novi Sad University	30	26.5	113	29.4	41	23.7	25	25.3	2	50	205	27.1
Unknowh	7	6.2	16	4.2	4	2.3	5	3.2	1	25.0	33	4.0

Table 13

PARENTS PROFESSION AND CHOICE OF FACULTY

Faculty of \ Professions	Workers Engaged in Agriculture and Forestry		Individual Farmers		Miners and Workers in Industry		Craftsmen		Workers in Communication and Transport		Workers in Trade and Commerce		Workers in Services		Workers Engaged in Security, Safety and Protection		Managers and Executives		Individual Specialist and Artists		Accounting and Clerical Staff		Professions		Persons with Private Income		Unknown Profession		Total	
	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)
1.Medicine			8	7.7	6	8.2	7	11.3	3	8.6	3	9.1			4	4.8	7	9.9	41	23.9	13	12.3	1	9.1	5	9.1			98	11.9
2.Natural sciences			13	12.5	11	15.1	5	8.1	2	5.7	1	3.0			9	10.8	8	11.3	24	14.0	17	16.0			9	16.4	3	25.0	102	12.3
3.Agriculture			13	12.5	5	6.8	3	4.8	4	11.4					2	2.4	1	1.4	1	0.6	2	1.9			1	1.8			32	3.9
4.Technology	1	100	5	4.8	4	5.5	3	4.8	1	2.9	1	3.0			1	1.2	4	5.6	5	2.9	6	5.7			3	5.5			34	4.1
5.Mechanical Engineering			5	4.8	2	2.7			1	2.9					5	6.0	1	1.4	5	2.9	5	4.7			1	1.8			25	3.0
6.Economics			9	8.7	12	16.4	5	8.1	2	5.7	4	12.1	1	9.1	5	6.0	8	11.3	13	7.6	7	6.6			4	7.3	1	6.3	71	8.6
7.Law			11	10.6	7	9.6	8	12.9	4	11.4	6	18.2	1	9.1	14	16.9	6	8.5	21	12.2	11	10.4	3	27.3	12	21.8	2	16.6	106	12.8
8.Philosophy			12	11.5	9	12.3	11	17.7	5	14.3	9	27.3	2	18.2	11	13.3	8	11.3	14	8.1	12	11.3	5	45.5	5	9.1			103	12.4
Faculties Outside Novi Sad University			26	25.0	15	20.7	13	21.0	12	34.2	8	24.3	7	63.6	26	31.4	26	36.5	42	10.4	30	28.3	[illegible]	18.1	13	23.6	26	35.7	225	27.1
Unknown			2	1.9	2	2.7	7	11.3	1	2.9	1	3.0			6	7.2	2	2.8	6	3.5	3	2.8			2	3.6	1	8.3	33	4.0

Table 14

PARENTS' PROFESSIONAL QUALIFICATION AND CHOICE OF FACULTY

QUALIFICATIONS / FACULTY OF	UNQUALIF.		SEMI-QUALIFIED		QUALIFIED		HIGHLY QUALIFIED		TOTAL	
	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. Medicine	1	12.5			1	2.3	12	11.6	14	8.6
2. Natural sciences	1	12.5	1	11.1	7	16.6	8	7.7	17	10.4
3. Agriculture	1	12.5			4	9.5	6	5.8	11	6.7
4. Technology			1	11.1	1	2.3	5	4.8	7	4.3
5. Mechanical engineering							2	1.9	2	1.2
6. Economics	1	12.5			7	16.6	13	12.6	21	12.9
7. Law			4	44.4	7	16.6	10	9.7	21	12.9
8. Philosophy	1	12.5	1	11.1	5	11.9	15	14.5	22	13.5
Faculties outside Novi Sad University	3	37.5	1	11.2	9	21.9	23	22.7	36	22.8
Unknown			1	11.1	1	2.3	9	8.7	11	6.7

Table 15

PROFESSIONAL EDUCATION OF PARENTS AND CHOICE OF FACULTY

PROFESSIONAL EDUCATION / FACULTY	Without school		Elementary school		Eight year school		Second. school		College		Univers.		Unknown		Total	
	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1. Medicine	6	23.0	5	7.5	5	6.0	14	7.5	18	13.0	34	25.0	2	5.8	34	12.5
2. Natural sciences	2	7.6	10	15.1	6	7.3	28	15.1	19	13.7	17	12.5	3	8.8	35	12.7
3. Agriculture	1	3.8	2	3.0	8	9.7	4	2.1	4	2.8			2	5.8	21	3.1
4. Technology	2	7.6	5	7.5	2	2.4	9	4.8	6	4.3	3	2.2			27	4.0
5. Mechanical engineering			1	1.5	5	6.0	4	2.1	6	4.3	5	3.6	2	5.8	23	3.4
6. Economics	2	7.6	7	10.6	7	8.5	11	5.9	13	9.4	8	5.8	2	5.8	50	7.4
7. Law	3	11.5	6	9.0	8	9.7	24	12.9	21	15.2	18	13.2	5	14.7	85	12.7
8. Philosophy	3	3.8	11	12.1	3	12.1	15	16.7	8	4.3	11	11.7	5	14.7	56	12.1
Faculties outside Novi Sad University	5	27.5	18	32.2	37	37.1	68	23.6	39	30.2	37	23.8	10	29.8	214	28.9
Unknown	2	7.6	1	1.5	1	1.2	8	4.3	4	2.8	3	2.2	3	8.8	22	3.2

Table 16

MONTHLY FAMILY INCOME AND CHOICE OF FACULTY

FACULTY OF \ MONTHLY FAMILY INCOME	Lower than 700 din.		700-1000 din.		1000 - 1300 din.		1300 - 1600 din.		1600 - 1900 din.		Higher than 1900 din.		UNKNOWN		TOTAL	
	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%	Abs. fig.	%
/1/	/2/	/3/	/4/	/5/	/6/	/7/	/8/	/9/	/10/	/11/	/12/	/13/	/14/	/15/	/16/	/17/
1. Medicine	1	2.3	7	9.5	11	8.5	7	8.0	8	15.1	54	15.9	10	9.8	98	11.8
2. Natural sciences	4	9.3	7	9.5	13	10.1	12	13.6	9	17.0	44	12.9	13	12.7	102	12.3
3. Agriculture	2	4.7	7	9.5	4	3.1	2	2.3	1	1.9	6	1.8	10	9.8	32	3.9
4. Technology	1	2.3	3	4.1	9	7.0	3	3.4	2	3.8	13	3.8	3	2.9	34	4.1
5. Mechanical engineering	2	4.7	2	2.7	4	3.1	3	3.4	3	5.7	9	2.6	2	2.0	25	3.0
6. Economics	7	16.3	5	6.8	18	14.0	4	4.5	5	9.4	28	8.2	4	3.9	71	8.6
7. Law	0		13	17.6	19	14.7	14	15.9	4	7.5	45	13.2	11	10.8	106	12.8
8. Philosophy	10	23.3	13	17.6	9	7.0	13	14.8	7	13.2	37	10.9	14	13.7	103	12.4
Faculties outside Novi Sad University	14	32.4	24	22.7	39	30.4	19	28.4	13	24.5	94	27.8	23	22.6	225	28.0
Unknown	2	4.7			3	2.3	5	5.7	1	1.9	10	2.9	12	11.8	33	4.0

Table 17

LOCATION OF FACULTY AND CHOICE OF FACULTY

LOCATION OF FACULTY / FACULTY OF	BELGRADE		NOVI SAD		OTHERS		TOTAL	
	Abs. fig.	%	Abs. fig.	%	Abs. fig.		Abs. fig.	%
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Medicine	40	40.8	55	56.1	3	3.1	98	100
2. Natural sciences	31	30.4	68	66.7	3	3.0	102	100
3. Agriculture	16	50.0	16	50.0			32	100
4. Technology	11	32.4	21	61.8	2	5.8	34	100
5. Mechanical engineering	13	52.0	12	48.0			25	100
6. Economics	36	50.7	33	46.5	2	2.8	71	100
7. Law	25	23.6	77	72.6	4	2.8	106	100
8. Philosophy	35	34.0	63	61.2	5	4.8	103	100
9. Unknown	4	12.1	2	6.1	27	81.9	33	100

Repeaters

Students who register for the same year of study in two subsequent years are defined as repeaters. They are explicitly considered in semesters I, III, V and VII.

Continuing Students

This term refers to students who continue from one semester to the next by successfully passing their examinations.

Newcomers from Outside and Returnees

A number of flows into the university may occur from outside. Students in this category have not been registered in the previous semester. The nature of these flows depends upon the semester of study under consideration. Because university regulations permit students who have not passed their examinations to return subsequently to take examinations (within one year for the first year of study, at any future date for subsequent years of study) there can be a flow of students who return in semester II, IV, VII, and VIII. This flow is specifically taken into account in the model.

Also, students can transfer from other schools in semester III, V and VII. These flows are also taken into account in the model. Especially important is a flow from the two-year colleges in semester V.

Graduates with 1st Diploma

Since the Faculties offer 1st diplomas after 2 years of study, these graduates are considered explicitly in the model.

Graduates with 2nd Diploma

Even though a student attends courses during the year of study, there may be a considerable delay before he obtains his diploma. This depends upon examinations he has yet to pass or projects he must complete. The model takes these time-lags into consideration. From the number of enrolled students in the 1st semester, a certain number passes over to the semester I^1 while other students remain behind in the 1st semester. Among those students remaining some will leave the university entirely, others only temporarily. Those who leave temporarily will next year repeat the 1st semester, enroll into the I^I year of study or leave definitively.

Students enrolled in semester II pass over to III or remain in the second.

The same principle is true for all semesters. In this way we get a picture of the flows of all student generations. Figures 2, 3 and 4 explicitly show an example of following the student flow of one generation as per streams. They show the students flow, from the first semester till their graduation, from semester to semester, including the flow off of those who leave their generation and join one of the following ones.

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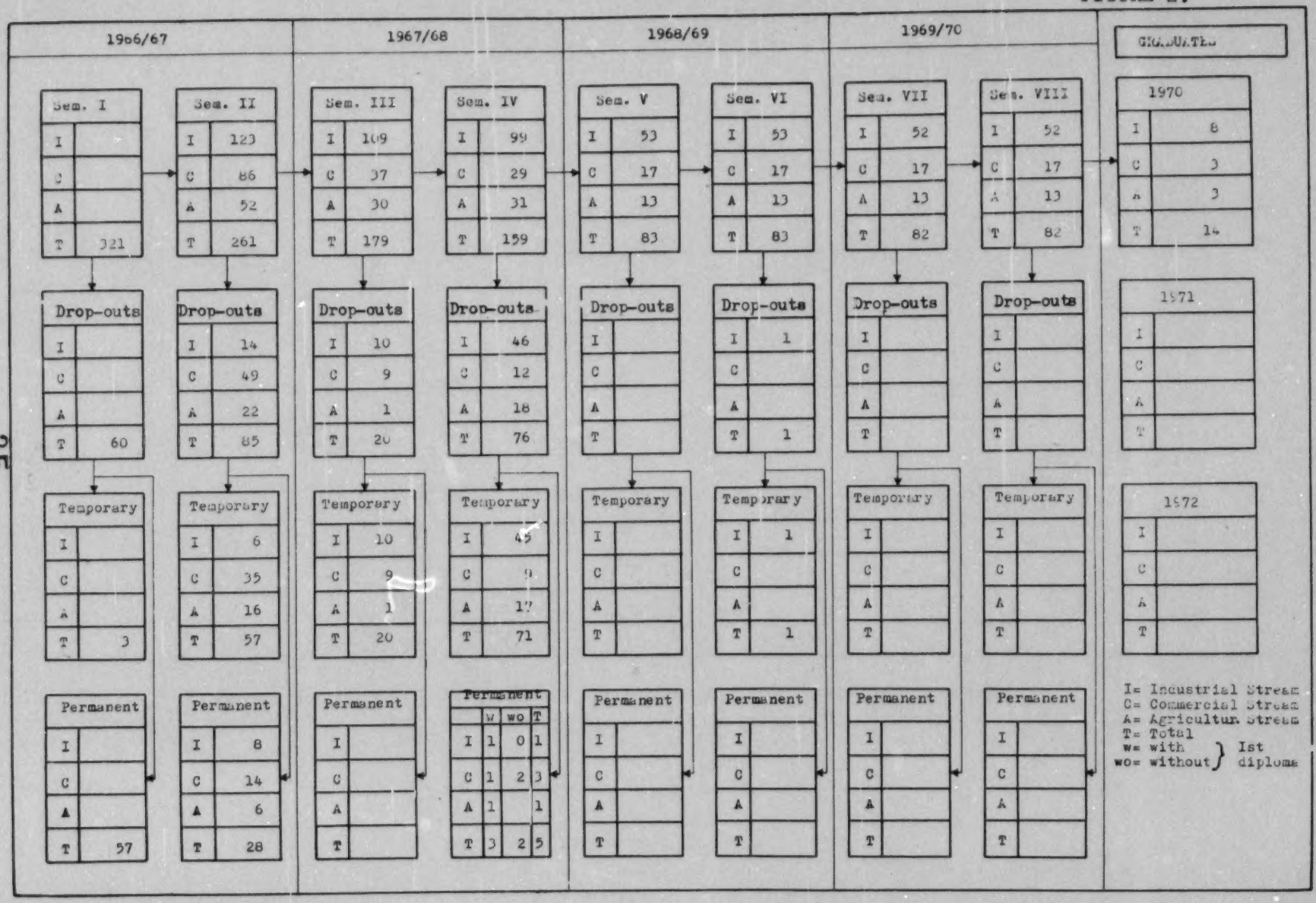
STUDENT FLOWS OF NONREPEATERS: NEW ENTRANTS IN SEMESTER I (1966/67)

UNIVERSITY OF NOVI SAD - FACULTY OF ECONOMICS

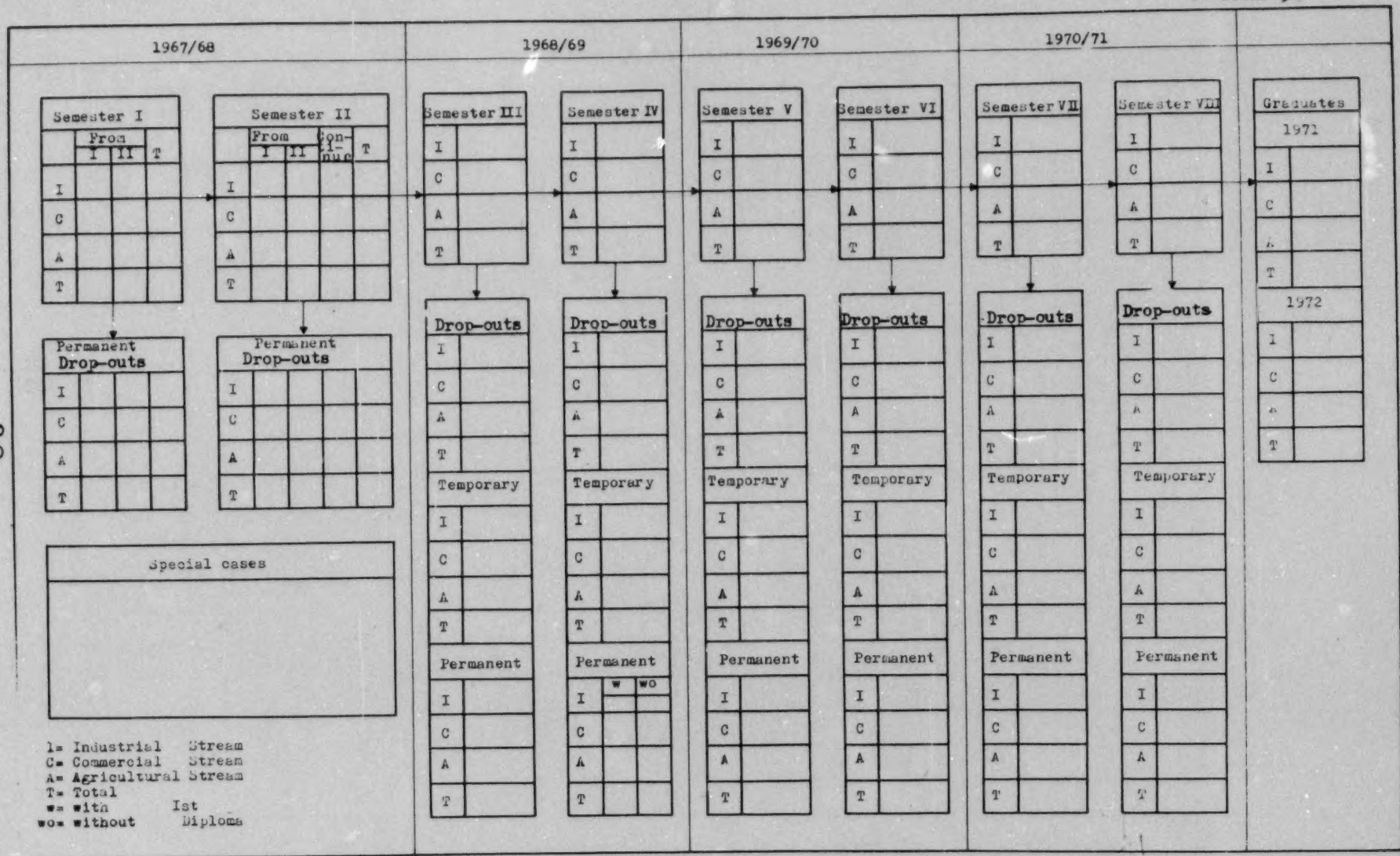
FIGURE 2.



FLOW OF STUDENTS REPEATING THE FIRST YEAR: NEW ENTRANTS IN SEMESTER I - 1966/67

UNIVERSITY OF NOVI SAD - FACULTY OF ECONOMICS

FIGURE 3.



REPEATERS (MORE THAN ONCE) : NEW-ENTRANTS IN 1966/67

FIGURE 4.

Number of Repeaters		Repeated Years												Permanent Drop-outs								Graduates		
		Year I			Year II			Year III			Year IV			Semester								Year		
		once	twice	many times	once	twice	many times	once	twice	many times	once	twice	many times	I	II	III	IV	V	VI	VII	VIII	70/71	71/72	--
Others	First Time in Year I																							
	First Time in Year II																							
	First Time in Year III																							
	First Time in Year IV																							
Total																								

In addition to student generations who begin their studies from the first semester, there are also student generations which enroll at this Faculty for the first time in the fifth semester. These students are treated as a separate generation because they are an important input for this Faculty. These students have previously graduated from a school of the same kind which lasted two years and now they enroll in the third semester.

Two kinds of dynamic analysis of students in this Faculty have been made. The first analysis comprises the so-called "pure" generations (generations which start with the first semester) and student generations which start in the beginning with the fifth semester.

The second analysis comprises the dynamics of all students in the Faculty, including the "pure" generations, students who enroll in the fifth semester, repeaters, students and transfers for single semesters from other Faculties.

The most important groups for this Faculty are the "clean" generations because they are most numerous. The relationship between input and output of a Faculty can really be compared only in this way. This is one of the most important indices of the result of a Faculty. Students begin their studies in the first semester. To link the input of the Faculty system with the requirements of university graduates based on feed-back, we must take into consideration the index of successfulness of any particular Faculty. The extent to which the need for university graduates will be met depends on the number of students enrolled. That means that the number of students who enroll in a given Faculty will depend on the demand for university graduates and on the effectiveness of their teaching. In this way those who create educational policy can decide whether a more or less selective policy will prevail for the enrolment of students in individual Faculties.

Working Technique

On the basis of the main enrolment register, lists have been drawn up of students who have enrolled in the first or fifth semester in a single academic year. The total number of students enrolled forms one generation of beginning students.

Each year the Faculty administration draws up lists of students enrolled in the particular study year. By comparing the names of students enrolled in the particular semesters and the lists of students who have started as a generation from the first or fifth semester, data is obtained about each student. The source material for the tables was elaborated in this way and the diagrams were drawn on the basis of these tables.

Results of the Preliminary Study

D.1. Student generations which started studies from the first and fifth semester.

From the given tables and diagrams of flows of students who have enrolled for the first time in the first or fifth semester, it can be concluded as follows:

Table 18

FLOW OF TEN GENERATIONS OF STUDENTS ENROLLED IN THE

YEARS 1960/61 - 1969/70

(The so-called "Pure Generations")

ABSOLUTE FIGURES

Generation and streams of study	Year and semester of study	I		II		III		IV		DIPLOMAS GRANTED	
										within six months after semester 8.	later than
		1.	2.	3.	4.	5.	6.	7.	8.		
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1960/61.	Total	213	204	140	140	105	105	101	101	28	61
	Industr.			36	36	60	60	59	59	20	32
	Commerc.			37	37	36	36	33	33	6	23
	Agricul.			17	17	9	9	9	9	2	6
1961/62.	Total	213	160	94	94	74	74	56	53	6	34
	Industr.			51	51	43	43	30	29	3	18
	Commerc.			26	26	22	22	17	16	2	9
	Agricul.			17	17	9	9	9	8	1	7
1962/63.	Total	275	197	110	110	80	74	71	71	11	17
	Industr.			50	50	35	30	23	23	4	7
	Commerc.			39	39	30	30	30	30	4	6
	Agricul.			21	21	15	14	13	13	3	4
1963/64.	Total	143	109	69	63	39	39	39	33	8	16
	Industr.	60	46	35	29	20	20	20	20	4	7
	Commerc.	59	45	24	24	14	14	14	14	3	7
	Agricul.	29	18	10	10	5	5	4	4	1	2
1964/65.	Total	242	185	85	83	66	65	63	63	11	24
	Industr.					21	21	20	20	3	11
	Commerc.					31	30	30	30	2	10
	Agricul.					14	14	13	13	6	3
1965/66.	Total	293	225	103	101	71	63	61	61	26	23
	Industr.					30	30	26	26	14	11
	Commerc.					33	30	27	27	10	9
	Agricul.					9	9	8	8	2	4
1966/67.	Total	324	261	179	159	83	83	82	82	15	16
	Industr.	133	123	109	99	53	53	52	52	9	10
	Commerc.	127	86	37	29	17	17	17	17	2	4
	Agricul.	64	52	30	31	13	13	13	13	4	2
1967/68.	Total	269	223	159	152	53	51	49	49		
	Industr.	96	79	46	43	13	13	13	13		
	Commerc.	139	116	92	89	29	27	25	25		
	Agricul.	34	28	21	20	11	11	11	11		
1968/69.	Total	411	235	163	165	33	33				
	Industr.	140	87	69	69	15	15				
	Commerc.	150	106	74	74	14	14				
	Agricul.	121	42	25	22	4	4				
1969/70.	Total	595	473	303	296						
	Industr.	221	166	131	122						
	Commerc.	201	135	114	111						
	Agricul.	173	127	63	63						

Table 19

FLOW OF TEN GENERATIONS OF STUDENTS ENROLLED IN YEARS 1960 - 1969/70

(The so-called "Pure Generations")

SEMESTER 1. = 100

Generation and stream of study / Year and semester of study		I		II		III		IV		DIPLOMAS GRANTED	
		1.	2.	3.	4.	5.	6.	7.	8.	within six months after semester 8.	later than
/1/		/2/	/3/	/4/	/5/	/6/	/7/	/8/	/9/	/10/	/11/
1960/61.	Total	100	94	64	64	48	48	46	46	13	28
	Industr.			100	100	70	70	69	69	23	40
	Commerci.			100	100	96	96	89	89	16	62
	Agricult.			100	100	53	53	53	53	12	35
1961/62.	Total	100	73	43	43	34	34	26	24	3	16
	Industr.			100	100	84	84	59	57	6	35
	Commerci.			100	100	85	85	65	62	8	35
	Agricult.			100	100	53	53	53	47	6	41
1962/63.	Total	100	72	40	40	29	28	26	26	4	6
	Industr.			100	100	70	60	56	56	8	14
	Commerci.			100	100	76	76	76	76	10	15
	Agricult.			100	100	71	67	62	62	14	19
1963/64.	Total	100	74	47	44	26	26	26	26	5	11
	Industr.	100	77	58	48	33	33	33	33	7	12
	Commerc.	100	76	41	41	24	24	24	24	5	12
	Agricult.	100	62	31	31	17	17	14	14	3	7
1964/65.	Total	100	76	35	34	27	27	26	26	5	10
	Industr.					100	100	95	95	14	57
	Commerc.					100	97	97	97	6	32
	Agricult.					100	100	93	93	43	21
1965/66.	Total	100	76	35	34	24	23	20	20	9	77
	Industr.					100	100	87	87	47	37
	Commerc.					100	91	82	82	30	24
	Agricult.					100	100	100	100	25	50
1966/67.	Total	100	81	55	49	26	26	25	25	5	5
	Industr.	100	92	83	74	40	40	39	39	8	8
	Commerc.	100	68	30	23	13	13	13	13	2	3
	Agricult.	100	81	47	48	20	20	20	20	6	3
1967/68.	Total	100	73	60	57	20	19	18	18		
	Industr.	100	82	48	48	14	14	14	14		
	Commerc.	100	83	66	64	21	19	18	18		
	Agricult.	100	82	62	59	32	32	32	32		
1968/69.	Total	100	56	41	40	81	81				
	Industr.	100	63	49	49	11	11				
	Commerc.	100	71	49	49	9	9				
	Agricult.	100	35	21	18	3	3				
1969/70	Total	100	80	52	50						
	Industr.	100	75	59	55						
	Commerc.	100	92	57	55						
	Agricult.	100	73	36	36						

Table 20

FLOW OF TEN GENERATIONS OF STUDENTS AND TRANSITION RATES

(The so-called "Pure Generations")

Year and semester of study / Generation		I		II		III		IV		DIPLOMAS GRANTED	
		1.	2.	3.	4.	5.	6.	7.	8.	within six months after semester 8.	later than
/1/		/2/	/3/	/4/	/5/	/6/	/7/	/8/	/9/	/10/	/11/
1960/61.	Absolute figures	218	218	140	140	105	105	101	101	28	61
	Transition rates %	93	69	100	75	100	96	100		28	60
1961/62.	Absolute figures	218	160	94	94	74	74	56	53	6	34
	Transition rates %	73	59	100	79	100	76	95		11	64
1962/63.	Absolute figures	275	197	110	110	80	74	71	71	11	17
	Transition rates %	72	56	100	73	93	96	100		16	24
1963/64.	Absolute figures	148	109	69	63	39	39	38	38	8	16
	Transition rates %	65	63	91	62	100	97	100		21	42
1964/65.	Absolute figures	242	185	85	83	66	65	63	63	11	24
	Transition rates %	76	46	98	80	98	97	100		18	38
1965/66.	Absolute figures	298	225	103	101	71	68	61	61	26	23
	Transition rates %	76	46	98	70	96	90	100		43	38
1966/67.	Absolute figures	324	261	179	159	83	83	82	82	15	16
	Transition rates %	81	69	89	52	100	99	100		18	20
1967/68.	Absolute figures	269	223	159	152	53	51	49	49		
	Transition rates %	83	71	96	35	96	96	100			
1968/69.	Absolute figures	411	235	168	165	33	33				
	Transition rates %	57	67	98	19	100					
1969/70.	Absolute figures	595	478	308	296						
	Transition rate %	80	64	96							

D.1.1. The number of students varies from year to year but has tended to increase, especially since 1968-69. This can be considered to be the consequence of liberalising admissions policies. On an average 300 students were enrolled in the first semester yearly. In the first years this number varied about 200 students and in the last years about 600 students.

D.1.2. The average dynamics of the flow of generations can be seen in Table 21. Of the average number of students enrolled in the first semester 21 per cent finish the eighth semester and 5 per cent graduate within 6 months after the eighth semester. That means that from the total number of students enrolled in the first semester, on an average a total of 15 per cent of one student generation enrolled together graduate. The largest percentage of graduates attended the industrial stream (17 per cent), followed by the commercial (10 per cent), while the smallest was the agro-economic stream (8 per cent).

D.1.3. There is a great difference in the number of students in the different semesters of study. After the first semester the number of students in the subsequent semesters decreases constantly. It can be observed that this decrease in the number of students is largest at the transition period between the first and second years of study, i.e., from the second to the third semester. An average of 50 per cent of the students in the first semester enroll in the third. It is understandable that the largest selection takes place after the first year. The second important selection takes place at the transition from the second to the third year of study. An average of 50 per cent of students enrolled in the fourth semester do not go on from the fourth to the fifth semester. The reason for this is that the students are obliged to pass all the second year examinations and to write a seminar paper before they are allowed to enroll in the third year. In the third and fourth years of study, there is no considerable decrease in the student-body size.

If it is true that after the first selection, i.e., after the first year of study, only those students who have enrolled with the intention and wish to finish their studies remain, then it is important to analyse the relation between the number graduating and the number of students enrolled in semester III. Leaving out those students who are only temporarily enrolled, the data reveal that 10.6 per cent of students remaining after the first selection graduate on time while 19.1 per cent graduate somewhat later. Together this makes 29.7 per cent.

D.1.4. By including in the analysis student generations which begin their studies at this Faculty in the fifth semester, the total result, i.e., the total number of graduates increases. However, if we take into consideration the ratio between the number of graduates and the number of students enrolled in the fifth semester, we conclude that those generations which began their studies in the first semester achieve a higher efficiency rate in studying than do those generations which enroll in the fifth semester.

D.1.5. The administration of the Faculty has decided to increase the quota on enrolments in the first year of study, on account of a considerable attrition among students before the end of their studies. However, the increased number of students enrolled brought along a new problem, that of space. It is true that it is only a problem for the first year of study. It cannot yet be said whether the liberalised admissions policies guarantee a relative higher rate of success among the generations enrolled.

D.2. All Generations, Repeaters and Transfer of Students

The other part of this research covers the dynamics of flows of all students of the Faculty of Economics in Subotica from 1960-61 till 1970-71. The first generation was composed of students who began their studies from the first semester and of students who in subsequent semesters came from other schools. In this generation there could not be repeaters. In all subsequent generations, in addition to the students mentioned, repeaters also show up. The conclusions will refer solely to students transferring in from other Faculties, or from extramural to regular studies, and cover the dynamics of student repeaters.

According to the present system of studies, a regular student of the first year has to finish this year within two years. For the other years of study there are no limitations on when they must be finished.

Flows of total number of students have been shown because lectures were not given on all years separately for each stream.

Conclusions can be drawn on the basis of the second diagram and on the basis of the comparison of the first and the second one.

From chart II, the overflows of students from one generation to the next is clearly evident. These are students who repeat or students who drop out for one year so that in the next year of study they are included in the next generation when they resume their studies. The most typical drop-out students is in the I, II or IV semester. The largest drop-out rate of students in this Faculty was in the first generations after the second semester and in recent years after the fourth semester. In the more advanced years of study, the number of repeaters is less and less. In the fourth year of study there are almost no repeaters. It could be concluded that the first two years of study represent the greatest barrier.

By comparing charts I and II, one observes that the number of graduates does not increase proportionally to the increase of the influx of repeaters and students from other Faculties. That means that the students involved repeat again or remain in a certain year of study.

Out of the total number of students who have finished the eight semesters of study by 1970-71, 30 per cent have not yet graduated.

Another conclusion that is also supported here is that the decisive point in a student's career at this Faculty is the transition from the fourth to the fifth semester. From the chart it can clearly be seen that at that point all generations become very narrow. If there were no influx of students from junior colleges the picture would be much more gloomy.

Table 21

FLOW OF THE AVERAGE NUMBER OF STUDENTS ENROLLED FOR TEN GENERATIONS IN THE YEARS 1960/61 - 1969/70

(The so-called "Pure Generations")

Generation and stream of study / Year and semester of study		I		II		III		IV		DIPLOMAS GRANTED	
		1.	2.	3.	4.	5.	6.	7.	8.	within six months after semester 8.	later than
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
All Students	Average	300	227	141	136	71	69	65	64	15	27
	Semester 1. = 100	100	76	47	45	24	23	21	21	5	9
	Previous semester = 100	-	76	62	96	52	97	91	97	23	42
Industrial Stream	Average	129	100	72	68	37	35	35	35	8	14
	Semester 1. = 100	100	76	56	53	29	27	27	27	6	11
Commercial Stream	Average	137	107	55	53	25	25	24	21	4	10
	Semester 1. = 100	100	78	40	39	18	18	17	15	3	7
Agricultural Stream	Average	89	53	25	25	10	10	10	8	3	4
	Semester 1. = 100	100	60	28	28	11	11	11	9	3	5

Table 22

FLOW OF TEN GENERATIONS OF STUDENTS ENROLLED IN THE YEARS 1960/61 - 1969/70

(The so-called "Pure Generations" plus-from semester 5 onward - graduates of junior colleges)

ABSOLUTE FIGURES

Generation and stream of study / Year and semester of study		I		II		III		IV		DIPLOMAS GRANTED	
		1.	2.	3.	4.	5.	6.	7.	8.	within six months after semester 8.	later than
/1/		/2/	/3/	/4/	/5/	/6/	/7/	/8/	/9/	/10/	/11/
1960/61	Total	218	204	140	14	143	140	125	124	30	76
	Industr.			86	86	90	88	77	76	21	44
	Commerc.			37	37	43	42	38	38	7	25
	Agricul.			17	17	10	10	10	10	2	7
1961/62	Total	218	160	94	94	132	107	81	78	8	46
	Industr.			51	51	64	59	41	40	4	25
	Commerc.			26	26	53	35	28	27	2	14
	Agricul.			17	17	15	13	12	11	2	7
1962/63	Total	275	197	110	110	149	140	134	126	21	52
	Industr.			50	50	62	56	53	52	8	25
	Commerc.			39	39	72	70	68	61	10	23
	Agricul.			21	21	15	14	13	13	3	4
1963/64	Total	148	109	69	63	109	84	81	75	15	40
	Industr.	60	46	35	29	47	35	35	33	4	14
	Commerc.	59	45	24	24	51	41	39	36	9	22
	Agricul.	29	18	10	10	11	8	7	6	2	4
1964/65	Total	242	185	85	83	81	76	69	69	14	25
	Industr.					29	27	22	22	4	11
	Commerc.					36	33	32	32	2	11
	Agricul.					16	16	15	15	8	3
1965/66	Total	298	225	103	101	97	82	69	69	29	28
	Industr.					37	33	27	27	14	12
	Commerc.					48	39	33	33	12	12
	Agricul.					12	10	9	9	3	4
1966/67	Total	324	261	179	159	122	111	100	100	18	
	Industr.	133	123	109	99	60	60	55	55	10	
	Commerc.	127	86	37	29	47	37	31	31	4	
	Agricul.	64	52	30	31	15	14	14	14	4	
1967/68	Total	269	223	159	152	130	94	76	76		
	Industr.	96	79	46	43	20	19	18	18		
	Commerc.	139	116	92	89	89	63	46	46		
	Agricul.	34	28	21	20	13	12	12	12		
1968/69	Total	411	235	168	165	78	78				
	Industr.	140	87	69	69	34	34				
	Commerc.	150	106	74	74	40	40				
	Agricul.	121	42	25	22	4	4				
1969/70	Total	295	478	308	296						
	Industr.	221	166	131	122						
	Commerc.	201	185	114	111						
	Agricul.	173	127	63	63						

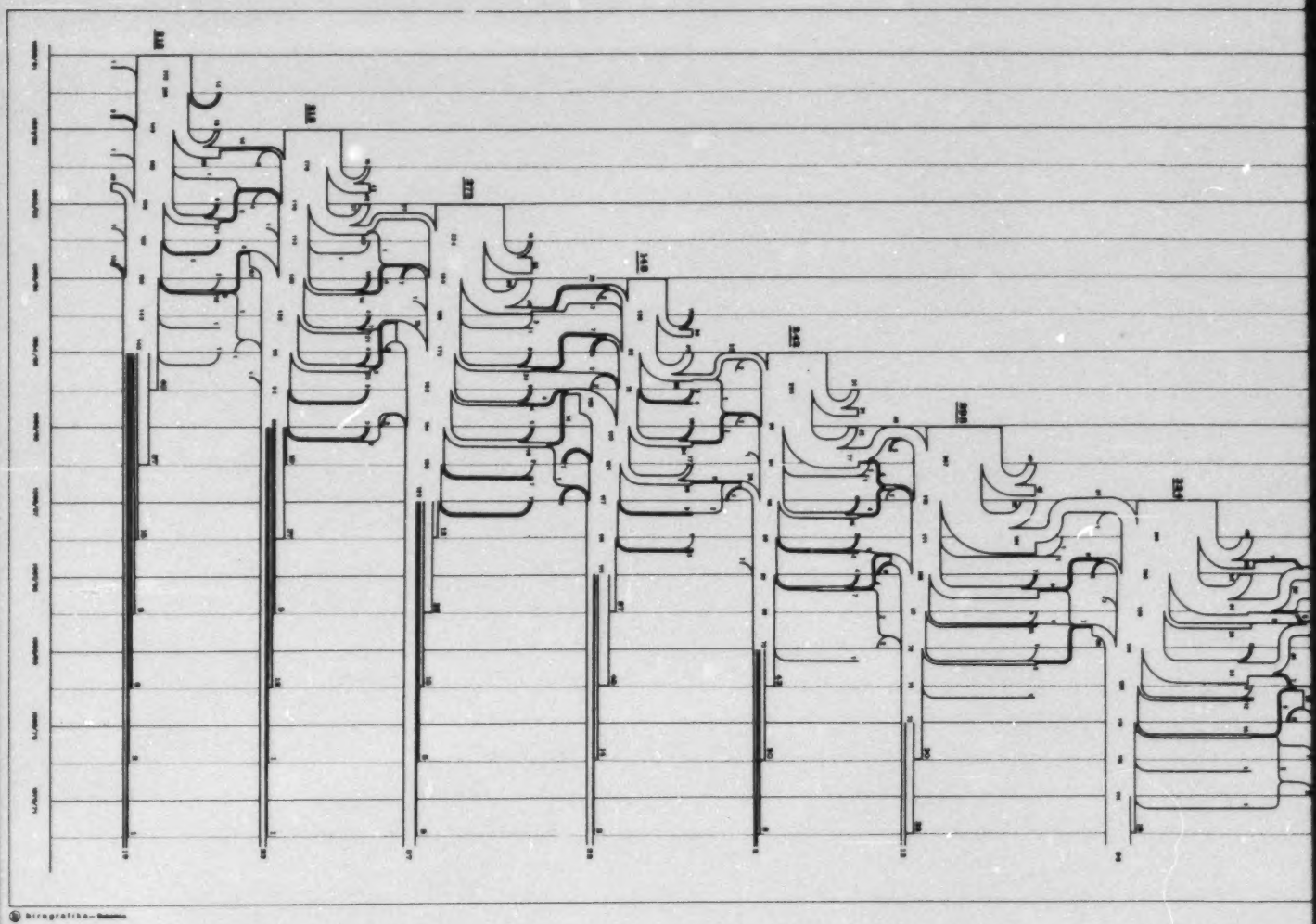
Table 23

FLOW OF TEN GENERATIONS OF STUDENTS ENROLLED IN THE YEARS 1960/61 - 1969/70

(The so-called "Pure Generations" plus-from semester 5 onward - graduates of junior colleges)

Semester 1.=100

Generation and stream of study / Year and semester of study		I		II		III		IV		DIPLOMAS GRANTED	
										within six months after semester 8.	later than
		1.	2.	3.	4.	5.	6.	7.	8.		
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1960/61	Total	100	94	64	64	66	64	57	57	14	35
	Industr.			100	100	105	102	90	88	24	51
	Commerc.			100	100	116	113	103	103	19	67
	Agricul.			100	100	59	59	59	59	12	41
1961/62	Total	100	73	43	43	61	49	37	36	4	21
	Industr.			100	100	125	115	80	73	8	49
	Commerc.			100	100	203	134	107	104	8	54
	Agricul.			100	100	88	76	71	65	12	41
1962/63	Total	100	72	40	40	54	51	49	46	8	19
	Industr.			100	100	124	112	106	104	16	50
	Commerc.			100	100	185	180	174	156	26	59
	Agricul.			100	100	71	67	62	62	14	19
1963/64	Total	100	74	47	44	74	57	55	51	10	27
	Industr.	100	77	58	48	78	58	53	55	7	23
	Commerc.	100	76	41	41	86	69	66	61	15	37
	Agricul.	100	62	31	31	38	28	24	21	7	14
1964/65	Total	100	76	35	34	33	31	28	28	6	10
	Industr.					100	93	74	76	14	38
	Commerc.					100	92	89	89	6	31
	Agricul.					100	100	94	94	50	19
1965/66	Total	100	76	35	34	33	28	23	23	10	9
	Industr.					100	89	73	73	41	25
	Commerc.					100	91	69	69	25	25
	Agricul.					100	83	75	75	25	33
1966/67	Total	100	81	55	49	38	34	31	31	6	
	Industr.	100	92	83	74	45	45	41	41	8	
	Commerc.	100	68	29	23	37	29	24	24	3	
	Agricul.	100	81	47	48	23	22	22	22	5	
1967/68	Total	100	73	59	57	48	35	28	28		
	Industr.	100	82	43	43	21	20	19	19		
	Commerc.	100	83	66	64	64	45	33	33		
	Agricul.	100	82	62	59	39	35	35	35		
1968/69	Total	100	56	41	40						
	Industr.	100	63	49	49						
	Commerc.	100	71	49	49						
	Agricul.	100	35	21	18						
1969/70	Total	100	80	52	50						
	Industr.	100	75	59	55						
	Commerc.	100	92	57	55						
	Agricul.	100	73	36	36						



TOKOVI STUDENATA
PRVIH JEDANAEST GENERACIJA
EKONOMSKOG FAKULTETA
U SUBOTICI

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